# Road & Bridge Design Publications

## Monthly Update – October 2015

Revisions for the month of **October** are listed and displayed below. The special detail index from September will remain in effect. E-mail questions related to the road changes to MDOT-Road-Design-Standards@michigan.gov. E-mail Bridge related questions to MDOT-Bridge-Design-Standards@michigan.gov.

## Road Design Manual

1.03.01: Order of Plan Sheets: The order of plan sheets was revised per a Statewide Design Alignment Team (SDAT) recommendation.

## Bridge Design Guides

Table of Contents: Added guides 6.20.03B&C, "Independent Backwall Sliding Slab Details".

6.20.03A: Moved layer of longitudinal reinforcement extending into approach slab to bottom. This leads to construction joint criteria as detailed on guide and adds extra reinforcement over beams. Extended minimum length of approach slab from 5 feet to 6.5 feet. Increased thickness of polystyrene blocking to 2" and increased length on approach side and added criteria that polystyrene and top of aggregate base/OGDC shall be at same level. This will prevent interaction between approach slab and top of backwall. Added note to use Special Provision for "Aggregate base Density, Bridge Approach". Reference to guide 5.46.01 for termination limits of aggregate base/OGDC.

6.20.03B: New guide to use with 6.20.03A & C. Note extra reinforcement in acute corner of slab, skew angle and approach slab length requirements.

6.20.03C: New Guide to use with 6.20.03A&B. Note skew angle & approach slab length requirements.

6.20.04: Updated construction joint criteria.

6.20.04B: Added note to use Special Provision for "Aggregate base Density, Bridge Approach". Updated/added detail of approach curb & gutter. Reference to guide 5.46.01 for termination limits of aggregate base/OGDC.

Updates to MDOT Cell Library, Bridge Auto Draw Program, etc., may be required in tandem with some of this month's updates. Until such updates to automated tools can be made, it is the designer's/detailer's responsibility to manually incorporate any necessary revisions to notes and plan details to reflect these revisions.

## 1.02.20 (continued)

### Log of Borings

Information that needs to be supplied along with the Borings are: date the boring was taken, who performed the boring, and the level of the water table (or "dry").

Construction Field Services Division and the Region/TSC Soils Engineer will analyze the boring information and make recommendations regarding pavement structure, subbase requirements, subgrade undercutting, foundation recommendations, sewer and culvert trench undercutting, bedding, dewatering needs, and other special treatments.

## 1.02.21 (revised 10-22-2012)

### Special Details

Special Detail plan sheets are used to show project specific items and details not covered by the standard plans. They are located in a folder in ProjectWise for MDOT internal access. These details are typically draft versions of new or revised standard plans awaiting final approval. These special detail sheets should be included in the final set of construction plans.

Modified Special Detail sheets may also be prepared by the designer to show other necessary details not covered by a standard plan or special detail provided by the Standards Unit. These may include gore details, guardrail installations, surfacing details and transitions, modifications of standard items, drainage details and so forth. See Section 1.02.02B for more information.

# 1.03

# MISCELLANEOUS

## 1.03.01 (revised 10-19-2015)

### Order of Plan Sheets

Plans should be assembled in the following order:

Title
Project Information
Legend
ROW Vicinity/Drainage Map
Note
Miscellaneous Quantities
Typical Cross Sections
Miscellaneous Details
Survey Information
Alignment
Removal, Construction, Drainage & Profile
Water Main & Sanitary Sewer
Maintaining Traffic/Construction Staging Plans
Detail Grades
Culvert Plans
Detention Basin Details
Wetland Mitigation Plans
Rest Area/Landscape Plans
Permanent Signing Plans
Pavement Marking Plans
Lighting Plans
Signal Plans
Log of Borings
Special Details
Bridge Plans

Removal, construction, drainage if needed, and profile sheets should be arranged in this order according to station limits.

Only the sheets included in a set of plans should appear in the index of the title sheet.

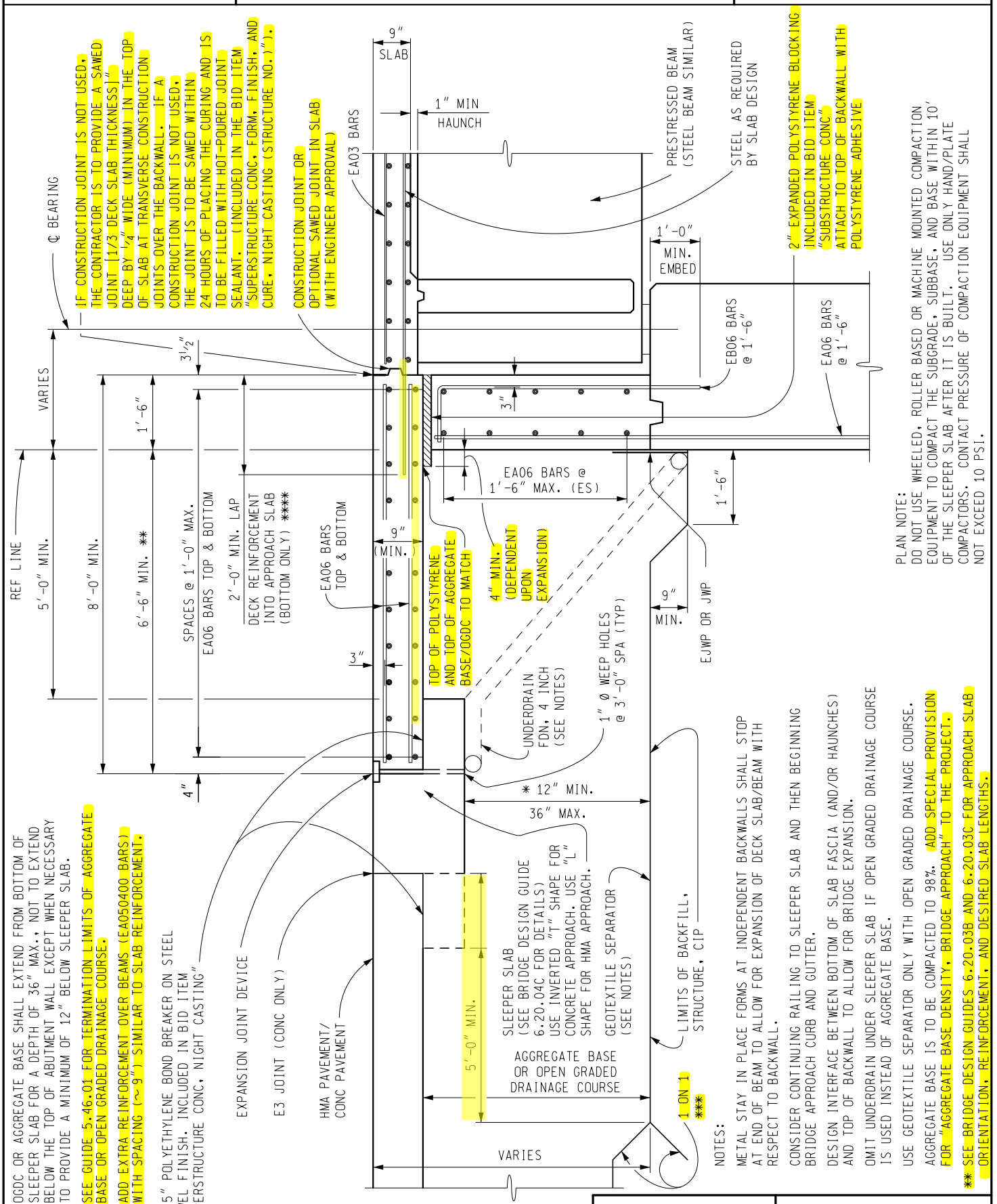
## CONTENTS

DRAWN BY: BLT
CHECKED BY: VZ
APPROVED BY: DAJ

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT

# TYPICAL SECTION THRU INDEPENDENT BACKWALL WITH SLIDING SLAB

ISSUED: 10/19/15
SUPERSEDES: 02/18/14




* OGDC OR AGGREGATE BASE SHALL EXTEND FROM BOTTOM OF SLEEPER SLAB FOR A DEPTH OF 36" MAX., NOT TO EXTEND BELOW THE TOP OF ABUTMENT WALL EXCEPT WHEN NECESSARY TO PROVIDE A MINIMUM OF 12" BELOW SLEEPER SLAB.

*** SEE GUIDE 5.46.01 FOR TERMINATION LIMITS OF AGGREGATE BASE OR OPEN GRADED DRAINAGE COURSE.

**** ADD EXTRA REINFORCEMENT OVER BEAMS (EA050400 BARS) WITH SPACING (~9") SIMILAR TO SLAB REINFORCEMENT.

0.025" POLYETHYLENE BOND BREAKER ON STEEL TROWEL FINISH. INCLUDED IN BID ITEM "SUPERSTRUCTURE CONC, NIGHT CASTING"

PLAN NOTE:
DO NOT USE WHEELED, ROLLER BASED OR MACHINE MOUNTED COMPACTION EQUIPMENT TO COMPACT THE SUBGRADE, SUBBASE, AND BASE WITHIN 10' OF THE SLEEPER SLAB AFTER IT IS BUILT. USE ONLY HAND/PLATE COMPACTORS. CONTACT PRESSURE OF COMPACTION EQUIPMENT SHALL NOT EXCEED 10 PSI.

NOTES:
METAL STAY IN PLACE FORMS AT INDEPENDENT BACKWALLS SHALL STOP AT END OF BEAM TO ALLOW FOR EXPANSION OF DECK SLAB/BEAM WITH RESPECT TO BACKWALL.

CONSIDER CONTINUING RAILING TO SLEEPER SLAB AND THEN BEGINNING BRIDGE APPROACH CURB AND GUTTER.

DESIGN INTERFACE BETWEEN BOTTOM OF SLAB FASCIA (AND/OR HAUNCHES) AND TOP OF BACKWALL TO ALLOW FOR BRIDGE EXPANSION.

OMIT UNDERDRAIN UNDER SLEEPER SLAB IF OPEN GRADED DRAINAGE COURSE IS USED INSTEAD OF AGGREGATE BASE.

USE GEOTEXTILE SEPARATOR ONLY WITH OPEN GRADED DRAINAGE COURSE.

AGGREGATE BASE IS TO BE COMPACTED TO 98%. ADD SPECIAL PROVISION FOR "AGGREGATE BASE DENSITY, BRIDGE APPROACH" TO THE PROJECT.

** SEE BRIDGE DESIGN GUIDES 6.20.03B AND 6.20.03C FOR APPROACH SLAB ORIENTATION, REINFORCEMENT, AND DESIRED SLAB LENGTHS.

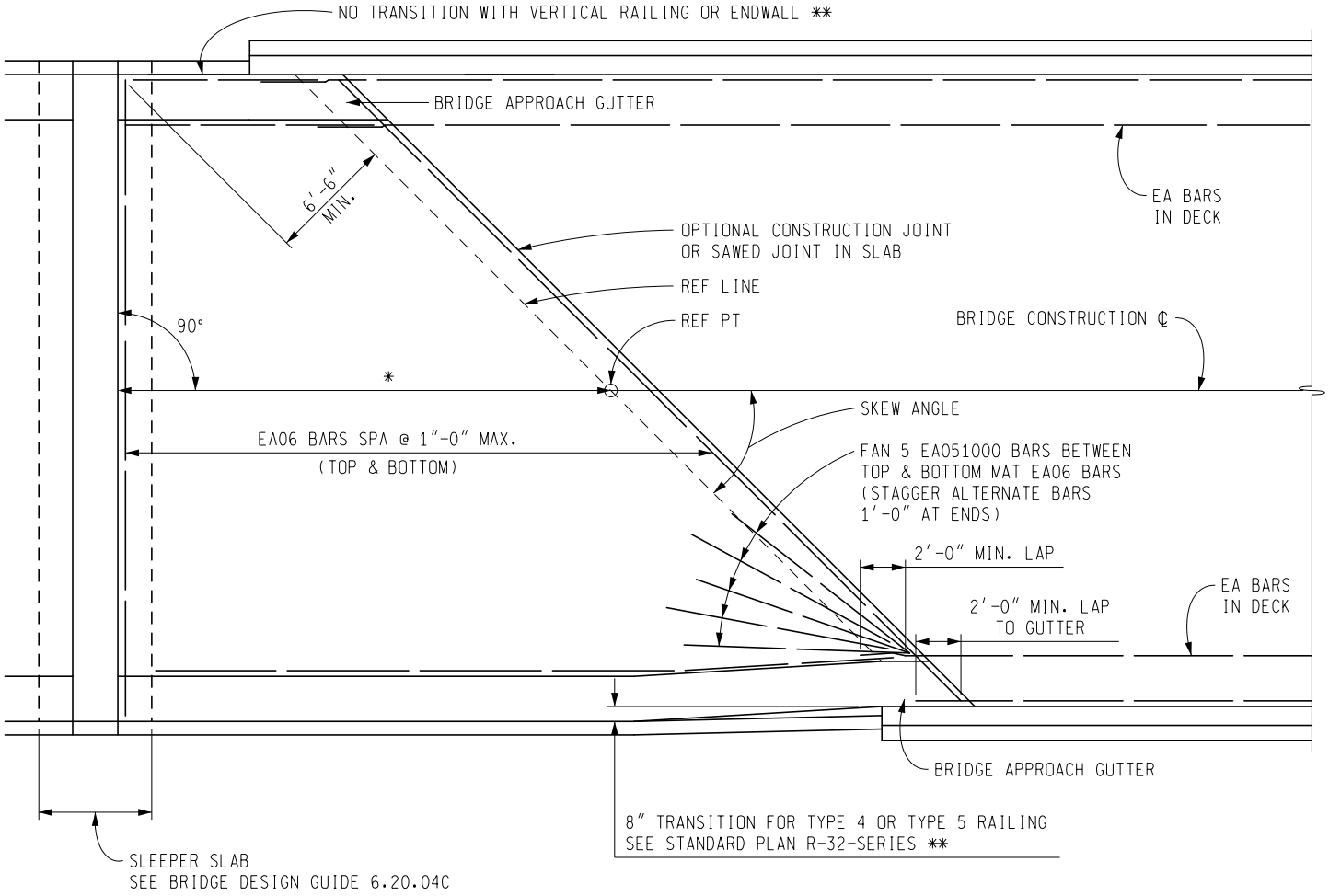
PREPARED BY DESIGN DIVISION

6.20.03A

| DRAWN BY: BLT<br>CHECKED BY: VZ<br>APPROVED BY: DAJ | MICHIGAN DEPARTMENT OF TRANSPORTATION<br>BUREAU OF HIGHWAY DEVELOPMENT<br>INDEPENDENT BACKWALL SLIDING SLAB DETAILS | ISSUED: 10/19/15<br>SUPERSEDES: / / |
|---|---|---|

* FOR DESIGN SPEEDS GREATER THAN 45 MPH (POSTED > 40 MPH), THE DESIGNER SHOULD MAKE THE APPROACH SLAB AS NEAR TO 20' (MEASURED ALONG ℄) AS PROJECT AND GEOMETRIC LIMITATIONS ALLOW.

** CONSIDER EXTENDING BARRIER TO SLEEPER SLAB THEN BEGINNING BRIDGE APPROACH CURB & GUTTER.




## PLAN OF APPROACH

SKEW ANGLE GREATER THAN 30°

NOTES:

ATTACH APPROACH CURB AND GUTTER TO THE APPROACH SLAB WITH BOTTOM MAT TRANSVERSE REINFORCEMENT AND TO THE BRIDGE DECK WITH BOTTOM MAT LONGITUDINAL REINFORCEMENT.

POUR APPROACH SLABS FROM EXPANSION LOCATION TOWARD REFERENCE LINE.

APPROACH SLABS SHOULD BE CAST AT NIGHT WITH NIGHT TIME CASTING OF SUPERSTRUCTURE CONCRETE.

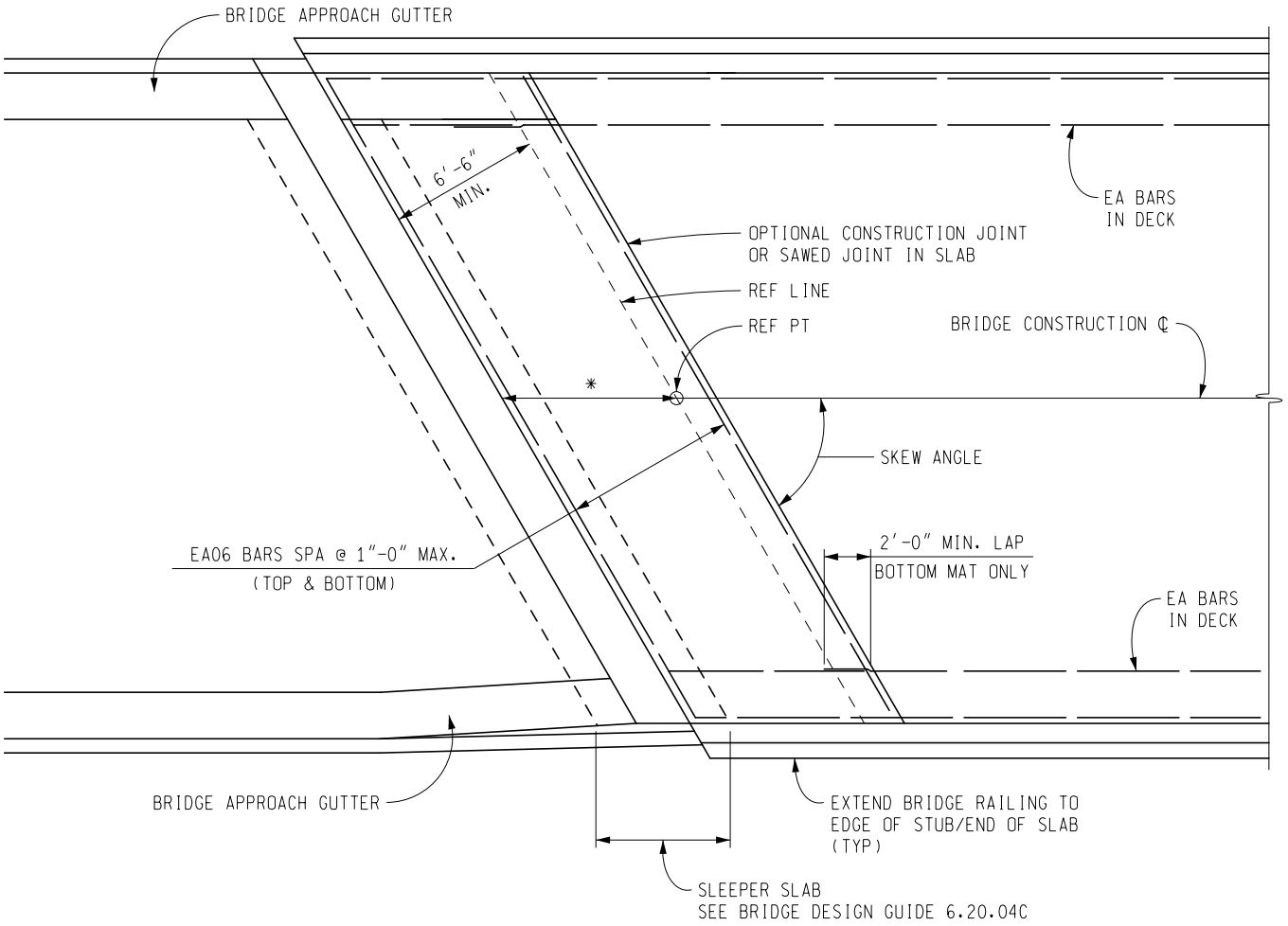
USE APPROACH SLAB DETAILS ON STANDARD PLAN R-45-SERIES WHEN THE LENGTH OF BRIDGE CONTRIBUTING TO EXPANSION AT AN ABUTMENT IS LESS THAN 50' FOR CONCRETE BEAM BRIDGES AND LESS THAN 25' FOR STEEL BEAM BRIDGES.

PLAN NOTE:
DO NOT USE WHEELED, ROLLER BASED OR MACHINE MOUNTED COMPACTION EQUIPMENT TO COMPACT THE SUBGRADE, SUBBASE, AND BASE WITHIN 10' OF THE SLEEPER SLAB AFTER IT IS BUILT. USE ONLY HAND/PLATE COMPACTORS. CONTACT PRESSURE OF COMPACTION EQUIPMENT SHALL NOT EXCEED 10 PSI.

| PREPARED BY DESIGN DIVISION | 6.20.03B |
|---|---|

| DRAWN BY: BLT<br>CHECKED BY: VZ<br>APPROVED BY: DAJ | MICHIGAN DEPARTMENT OF TRANSPORTATION<br>BUREAU OF HIGHWAY DEVELOPMENT<br>INDEPENDENT BACKWALL SLIDING SLAB DETAILS | ISSUED: 10/19/15<br>SUPERSEDES: / / |
|---|---|---|

* FOR DESIGN SPEEDS GREATER THAN 45 MPH (POSTED > 40 MPH), THE DESIGNER SHOULD MAKE THE APPROACH SLAB AS NEAR TO 20' (MEASURED ALONG ℄) AS PROJECT AND GEOMETRIC LIMITATIONS ALLOW.




## PLAN OF APPROACH

SKEW ANGLE 30° OR LESS

NOTES:

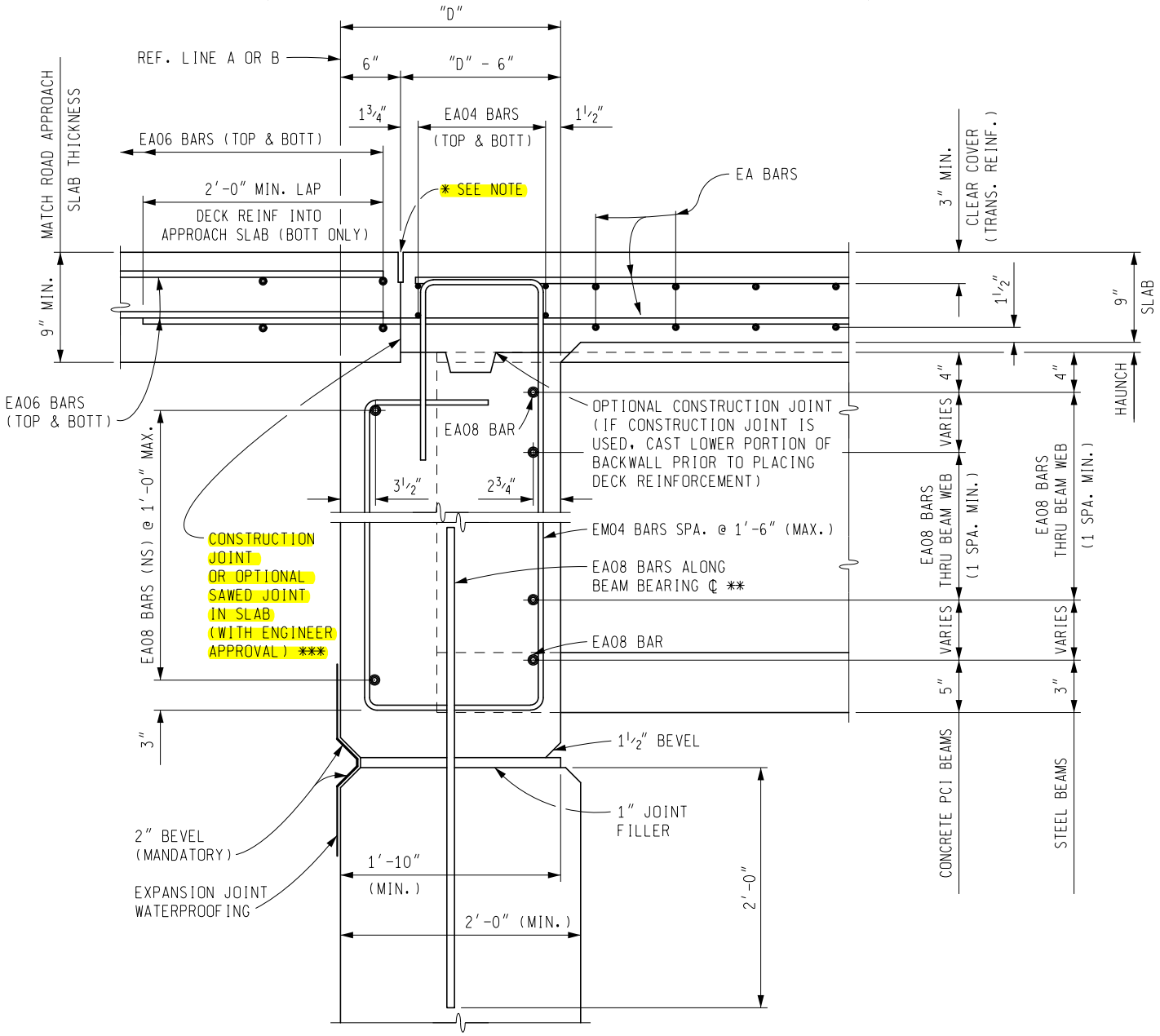
POUR APPROACH SLABS FROM EXPANSION LOCATION TOWARD REFERENCE LINE.

APPROACH SLABS SHOULD BE CAST AT NIGHT WITH NIGHT TIME CASTING OF SUPERSTRUCTURE CONCRETE.

PLAN NOTE:
DO NOT USE WHEELED, ROLLER BASED OR MACHINE MOUNTED COMPACTION EQUIPMENT TO COMPACT THE SUBGRADE, SUBBASE, AND BASE WITHIN 10' OF THE SLEEPER SLAB AFTER IT IS BUILT. USE ONLY HAND/PLATE COMPACTORS. CONTACT PRESSURE OF COMPACTION EQUIPMENT SHALL NOT EXCEED 10 PSI.

| PREPARED BY DESIGN DIVISION | 6.20.03C |
|---|---|

| DRAWN BY: BLT<br>CHECKED BY: VZ<br>APPROVED BY: DAJ | MICHIGAN DEPARTMENT OF TRANSPORTATION<br>BUREAU OF HIGHWAY DEVELOPMENT<br>INTEGRAL AND SEMI-INTEGRAL ABUTMENT BACKWALL | ISSUED: 10/19/15<br>SUPERSEDES: 06/17/13 |
|---|---|---|




PLAN NOTES:

WHERE OPTIONAL CONSTRUCTION JOINTS ARE USED, THERE WILL BE NO PAYMENT FOR THE REQUIRED JOINT WATERPROOFING.

* IF A CONSTRUCTION JOINT IS NOT USED, THE CONTRACTOR IS TO PROVIDE A SAWED JOINT [1/3 DECK SLAB THICKNESS]" DEEP BY ¼" WIDE (MINIMUM) IN THE TOP OF SLAB AT TRANSVERSE CONSTRUCTION JOINTS OVER THE BACKWALL. IF A CONSTRUCTION JOINT IS NOT USED, THE JOINT IS TO BE SAWED WITHIN 24 HOURS OF PLACING THE CURING AND IS TO BE FILLED WITH HOT-POURED JOINT SEALANT. (INCLUDED IN THE BID ITEM "SUPERSTRUCTURE CONC, FORM, FINISH, AND CURE, NIGHT CASTING (STRUCTURE NO.)").

NOTES:

INTEGRAL AND SEMI-INTERGRAL ABUTMENT BRIDGES SHALL BE CONSIDERED FOR STEEL BRIDGES LESS THAN 300' AND CONCRETE BRIDGES LESS THAN 400' IN LENGTH.

APPROACH SLAB THICKNESS WILL MATCH THE ROAD APPROACH THICKNESS (9" MIN.)

CONTINUE BOTTOM MAT OF REINFORCEMENT THROUGH CONSTRUCTION JOINT. ADD EXTRA REINFORCEMENT OVER BEAM (EA050400 BARS).

** USE FOR INTEGRAL ABUTMENT BRIDGES ONLY.

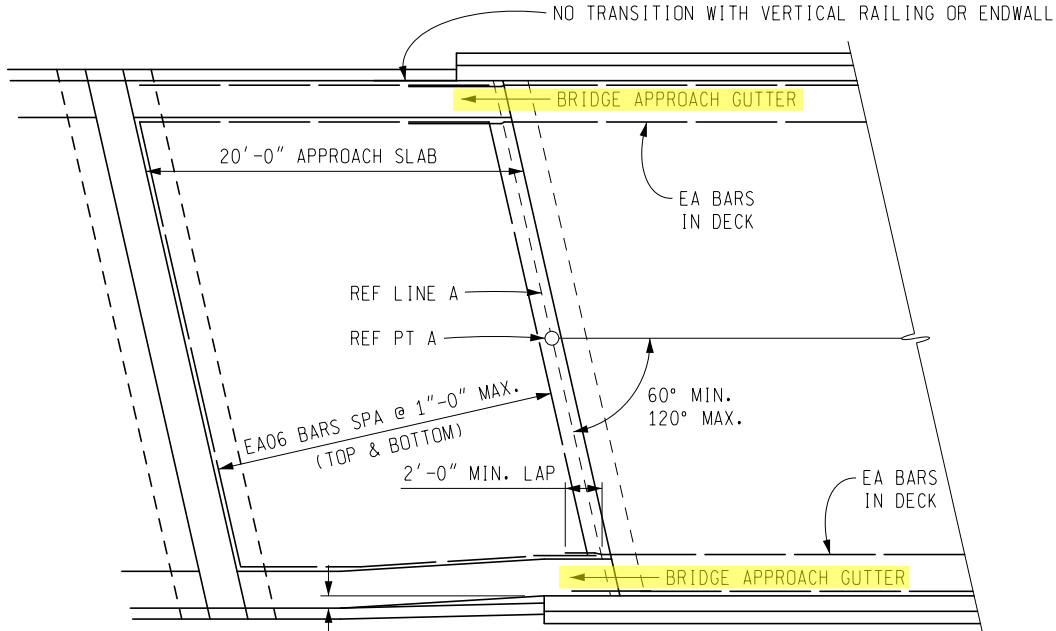
*** THE JOINT IS NOT OPTIONAL, BUT REQUIRED IF CASE I (SEE BRIDGE MANUAL 7.03.01) REQUIRES NOT BACKFILLING ABOVE THE BRIDGE SEAT.

SEMI-INTEGRAL ABUTMENTS SHOULD BE USED AT STREAM CROSSINGS.

D = BACKWALL THICKNESS. SEE GUIDE 6.20.01 FOR DEFINITION.

| PREPARED BY DESIGN DIVISION | 6.20.04 |
|---|---|

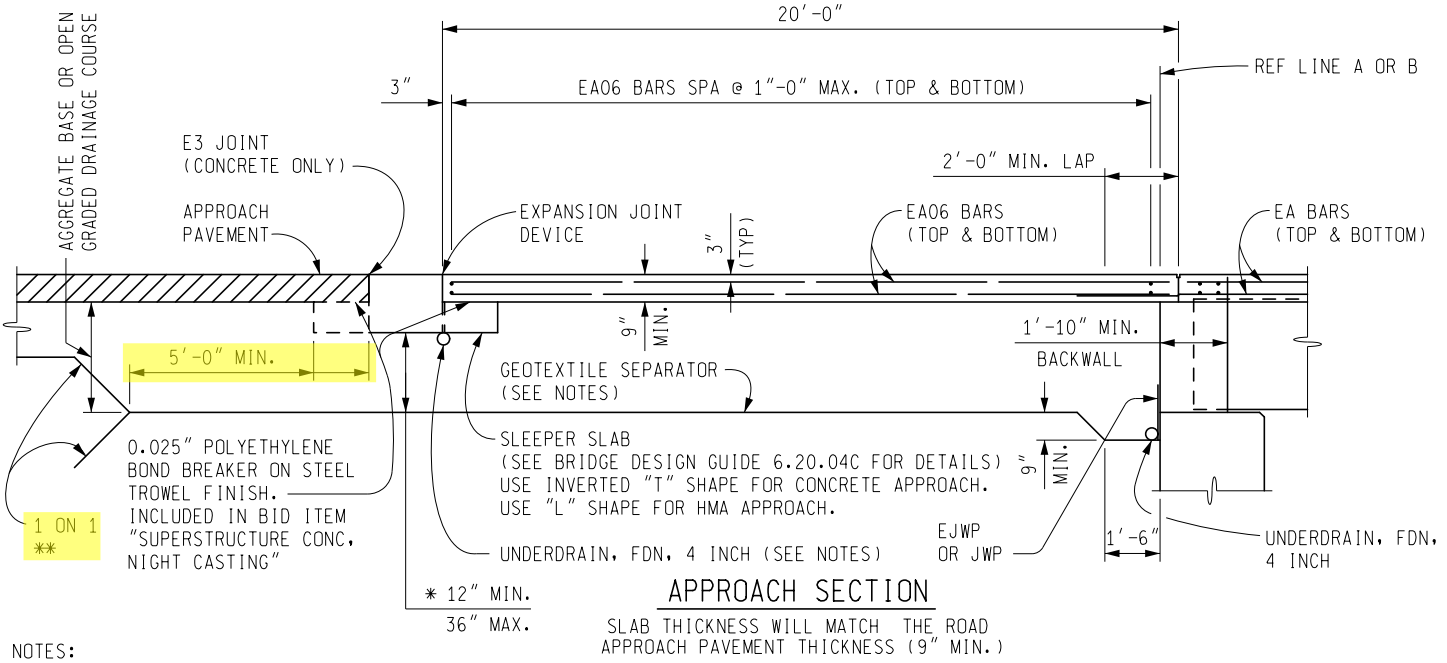
| DRAWN BY: BLT<br>CHECKED BY: VZ<br>APPROVED BY: DAJ | MICHIGAN DEPARTMENT OF TRANSPORTATION<br>BUREAU OF HIGHWAY DEVELOPMENT<br>INTEGRAL AND SEMI-INTEGRAL ABUTMENT<br>EMPIRICAL APPROACH SLAB DETAILS | ISSUED: 10/19/15<br>SUPERSEDES: 02/18/14 |
|---|---|---|




* OGDC OR AGGREGATE BASE SHALL EXTEND FROM BOTTOM OF SLEEPER SLAB FOR A DEPTH OF 36" MAX., NOT TO EXTEND BELOW THE TOP OF ABUTMENT WALL EXCEPT WHEN NECESSARY TO PROVIDE A MINIMUM OF 12" BELOW SLEEPER SLAB.

8" TRANSITION FOR TYPE 4 OR TYPE 5 RAILING SEE STANDARD PLAN R-32-SERIES

## PLAN OF APPROACH




## APPROACH SECTION

SLAB THICKNESS WILL MATCH THE ROAD APPROACH PAVEMENT THICKNESS (9" MIN.)

NOTES:

ATTACH APPROACH CURB AND GUTTER TO THE APPROACH SLAB WITH BOTTOM MAT TRANSVERSE REINFORCEMENT AND TO THE BRIDGE DECK WITH BOTTOM MAT LONGITUDINAL REINFORCEMENT.

POUR APPROACH SLABS FROM EXPANSION LOCATION TOWARD REFERENCE LINE.

APPROACH SLABS SHOULD BE CAST AT NIGHT WITH NIGHT TIME CASTING OF SUPERSTRUCTURE CONCRETE.

AGGREGATE BASE IS TO BE COMPACTED TO 98%. ADD SPECIAL PROVISION FOR "AGGREGATE BASE DENSITY, BRIDGE APPROACH" TO THE PROJECT.

USE GEOTEXTILE SEPARATOR ONLY WITH OPEN GRADED DRAINAGE COURSE.

OMIT UNDERDRAIN UNDER SLEEPER SLAB IF OPEN GRADED DRAINAGE COURSE IS USED INSTEAD OF AGGREGATE BASE.

USE SLEEPER SLAB WITH ALL APPROACH SLABS INCLUDING HMA ROADWAY.

USE APPROACH SLAB DETAILS ON STANDARD PLAN R-45-SERIES WHEN THE LENGTH OF BRIDGE CONTRIBUTING TO EXPANSION AT AN ABUTMENT IS LESS THAN 50' FOR CONCRETE BEAM BRIDGES AND LESS THAN 25' FOR STEEL BEAM BRIDGES.

** SEE GUIDE 5.46.01 FOR TERMINATION LIMITS OF AGGREGATE BASE OR OPEN GRADED DRAINAGE COURSE.

PLAN NOTE:
DO NOT USE WHEELED, ROLLER BASED OR MACHINE MOUNTED COMPACTION EQUIPMENT TO COMPACT THE SUBGRADE, SUBBASE, AND BASE WITHIN 10' OF THE SLEEPER SLAB AFTER IT IS BUILT. USE ONLY HAND/PLATE COMPACTORS. CONTACT PRESSURE OF COMPACTION EQUIPMENT SHALL NOT EXCEED 10 PSI.

| PREPARED BY DESIGN DIVISION | 6.20.04B |
|---|---|